

CLAIMS:

We claim:

1. A method of recovering energy that comprises:

5 Providing a multiple circulation path integrated plate fin and tube or finned tube heat exchanger that can be used in heat transfer system that comprises the steps of:

- a. providing a first working fluid circulation path on a finned exterior side of a heat transfer device,
- 10 b. feeding the first working fluid to the circulation path on the exterior finned side of a heat transfer zone to transfer heat to or from the first working fluid thereby heating or cooling the first working fluid to a higher or lower temperature, and feeding a second working fluid into a second interior (tube side)circulation path within a heat exchanger to be heated or cooled by the first working fluid and
- 15 c. providing a third fluid circulation path in the heat exchanger and feeding a third working fluid into the third interior(tube side)circulation path to be heated or cooled by the first working fluid.
- d. interweaving the second and third fluid flow paths of the exchanger to achieve more efficient heat transfer characteristics than can be achieved with the same streams arranged in series.

25 2. The method of claim 1 wherein the first working fluid and the second working fluid have the same composition.

3. The method of claim 1 where the first working fluid and the second working fluid are of different composition.

30 4. The method of claim 1 wherein more than two working fluid circulation pathways are provided in the interior (tube side) of the exchanger.

5. A method of construction of a heat exchanger that comprises providing a plurality of circulation paths in a plate finned and tube or finned tube exchanger utilizing a plurality of tube side circuits that are interlaced to accomplish more effective heat transfer than would be possible with a plurality of tube side fluid streams arranged in series without interlacing the circuitry.
6. The method of claim 4 wherein the first working fluid and the second working fluid have the same composition.
7. The method of claim 4 where the tube working fluids are of different composition.
- 10 8. An energy recovery apparatus that comprises: a finned surface heat exchanger comprising a plurality of circulation pathways for a plurality of working fluids, and circulation means to pass a plurality of working fluids into at least one heat exchange zone.
9. The apparatus of claim 8 wherein the apparatus comprises a plurality working fluid streams in circulation pathways of a plate fin and tube or finned tube exchanger.
- 15 10. The apparatus of claim 9 further comprising multiple heat recovery stages to provide additional heat recovery.
11. A method for designing an energy recovery system for increasing the efficiency of a gas turbine exhaust heat recovery by providing an integrated tube side heating circuitry to heat a plurality of working fluid circuits while cooling the exhaust stream of the gas turbine.